

Spot Safety Project Evaluation

Spot Safety Project # 07-06-201

**Spot Safety Project Evaluation of the Signal Installation and
the Addition of a Northbound Right Turn Lane on Lewiston Road
SR 2124 (Lewiston Road) at SR 2187 (Jessup Grove Road)
Guilford County**

Documents Prepared By:

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Safety Evaluation Group
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6-14-2013

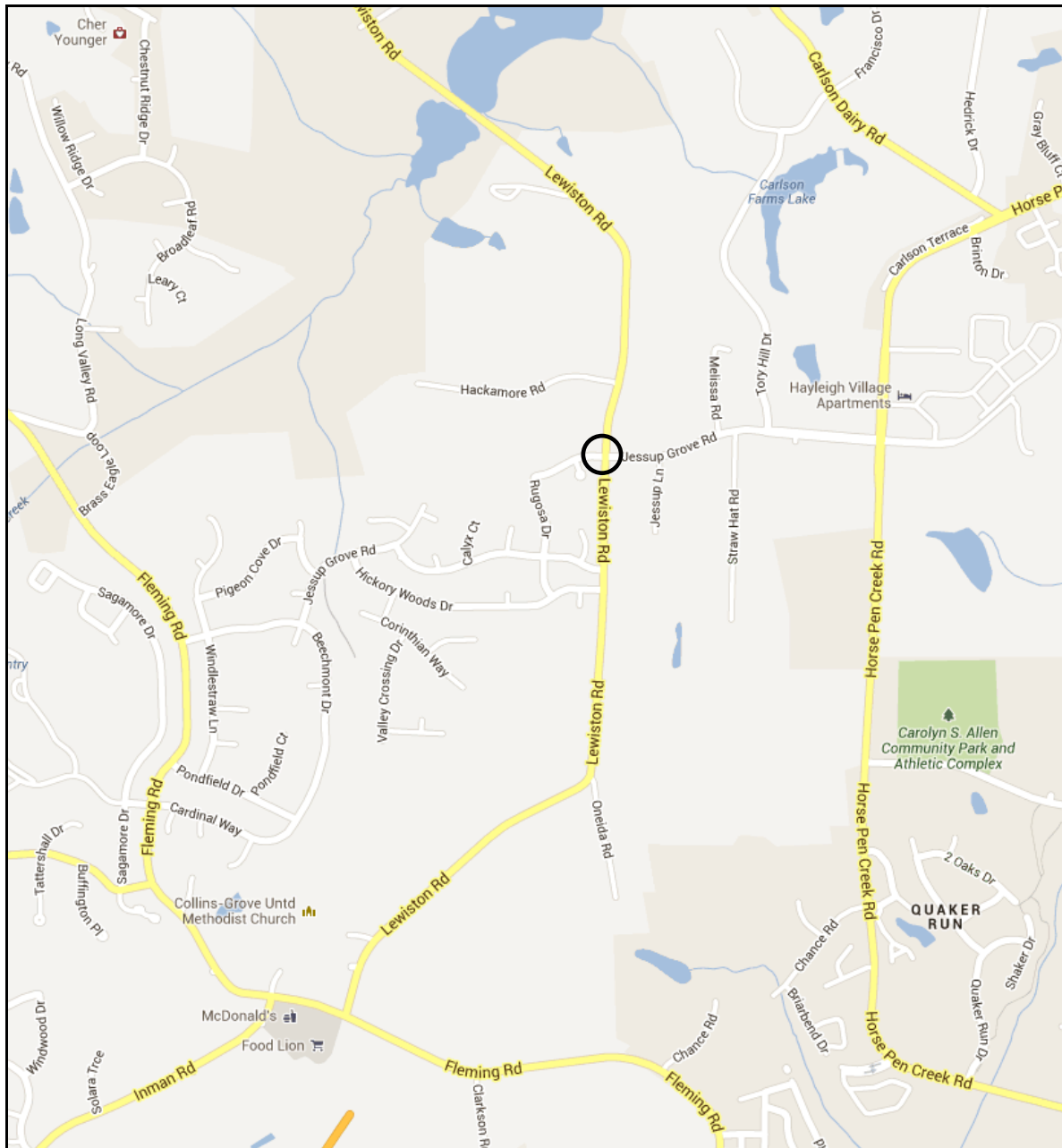
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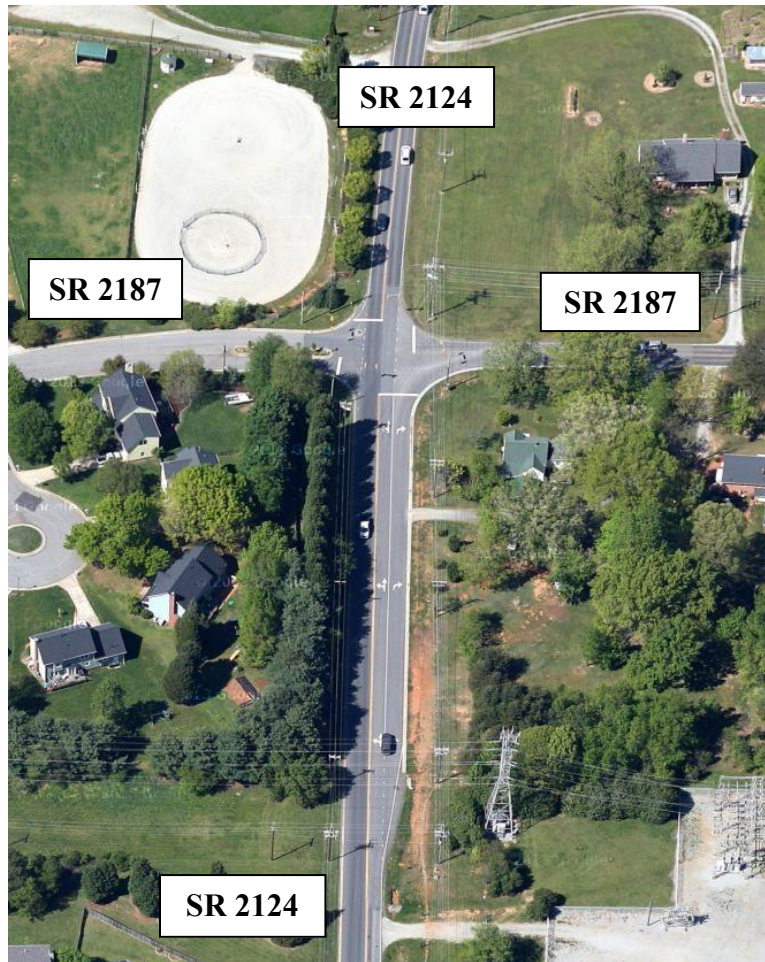
Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 07-06-201 located at the Intersection of SR 2124 (Lewiston Road) at SR 2187 (Jessup Grove Road) in Guilford County.

The Sig ID is 07-2102 for this 2-Phase Fully Actuated Traffic Signal.





Aerial Provided from Google Maps

Project Information and Background from the Project File Folder

The spot safety project improvement countermeasure chosen for the subject location was the installation of a 2-phase fully actuated traffic signal and the addition of a right turn lane on the southern leg of SR 2124 (Lewiston Road).

SR 2124 (Lewiston Road) and SR 2187 (Jessup Grove Road) are both 2-lane facilities. The speed limit on the western leg of SR 2187 (Jessup Grove Road) is 30 mph. This leg is the entrance to Lewiston Oaks subdivision. The speed limit on the other three legs is 45 mph. The subject location is a four-leg crossroads intersection which was previously controlled by the use of stop signs on SR 2187 (Jessup Grove Road).

The original statement of problem was the occurrence of Frontal Impact Crashes between vehicles entering from SR 2187 (Jessup Grove Road) and vehicles traveling on SR 2124 (Lewiston Road). The initial crash analysis was completed from June 1, 2000 to May 31, 2005 with eleven (11) reported crashes. The final completion date for the improvement at the subject intersection was on December 18, 2008 with a total cost of \$162,500.00.

Naive Before and After Analysis

After reviewing the spot safety project file folder along with all the crashes at the subject location, the crash data omitted from this analysis to consider for an adequate construction period were the months of October through December 2008. The before period consisted of reported crashes from June 1, 2004 through September 30, 2008 (4 years, 4 months); the after period consisted of reported crashes from January 1, 2009 through April 30, 2013 (4 years, 4 months). The ending date for this analysis was determined by the date of available crash data at the time of analysis.

The treatment data consisted of all crashes within 150 feet of the intersection of SR 2124 (Lewiston Road) at SR 2187 (Jessup Grove Road) for all approaches. *Please see attached location map and aerial map for further details.*

The following data table depicts the Naive Before and After Analysis for the treatment location. Please note that Frontal Impact Crashes were the target crashes for the applied countermeasure. The Frontal Impact Crash Types considered are as follows: Left-turn, same roadway; Left-turn, different roadways; Right-turn, same roadway; Right-turn, different roadways; Head-on; and Angle.

<u>Treatment Information</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Total Crashes	7	8	+ 14.3 %
Total Severity Index	6.29	5.63	- 10.5 %
Target Crashes (Frontal Impact)	7	4	- 42.9 %
Target Crash Severity Index	6.29	4.70	- 25.3 %
Volume (2006, 2011)	7200	8700	+ 20.8 %

<u>Injury Crash Summary</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Fatal injury Crashes	0	0	N/A
Class A injury Crashes	0	0	N/A
Class B injury Crashes	2	1	- 50.0 %
Class C Injury Crashes	3	4	+ 33.3 %
Property Damage Only	2	3	+ 50.0 %

The naive before and after analysis at the treatment location resulted in a 14.3 percent increase in Total Crashes, a 42.9 percent reduction in Target Frontal Impact Crashes, and a 10.5 percent reduction in the Total Severity Index. The before period ADT year was 2006 and the after period ADT year was 2011.

To further analyze the intersection crash patterns, the following chart shows different traffic movements and the change in crash totals through the study:

<u>Additional Information</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Left Turn, Different Roadway (Target)	3	1	- 66.7 %
Angle (Target)	4	0	- 100.0 %
Left Turn, Same Roadway (Target)	0	3	N/A
Rear End, Slow or Stop	0	3	N/A

Results and Discussion

Referencing the *Collision Diagrams* and the above tables, the Frontal Impact Target Crashes were reduced from seven (7) in the before period to four (4) in the after period. As stated above, the original statement of problem was the occurrence of Frontal Impact Crashes between vehicles entering from SR 2187 (Jessup Grove Road) and vehicles traveling on SR 2124 (Lewiston Road). Only one (1) of the Frontal Impact Crashes which occurred in the after period involved a vehicle entering from SR 2187 (Jessup Grove Road). The other three (3) Frontal Impact Crashes that occurred in the after period were Left Turn, Same Roadway Crashes on SR 2124 (Lewiston Road). Note that Angle Crashes experienced a 100 percent reduction from the before period to the after period. Three (3) Rear End Crashes occurred in the after period which is an increase from zero (0) in the before period.

Please see the attached *Treatment Site Photos*. Photos are provided from Google Street View for all four approaches to the study intersection. As the Safety Evaluation Group facilitates additional spot safety reviews for these types of countermeasures, it is the goal to be able to provide objective and definite information regarding actual crash reduction factors for these types of treatments.

Treatment Site Photos from Google Street View



Google Maps (May 2012) – Looking North on SR 2124 Approach



Google Maps (May 2012) – Looking South on SR 2124 Approach



Google Maps (May 2012) – Looking West on SR 2187 Approach



Google Maps (May 2012) – Looking East on SR 2187 Approach

SS# 07-06-201
 Guilford County
 BEFORE Period
 6/1/04 - 9/30/08



LEGEND			
	MOVING VEHICLE		ANGLE
	PARKED VEHICLE		TURNING
	PARKING VEHICLE		BACKING
	MOVABLE OBJECT		SIDESWIPE
	HEAD ON		INJURY
	REAR END		FATALITY
	RAN OFF ROAD		9 MPH OR LESS
	DAYLIGHT CRASH		10 MPH TO 19
	NIGHT CRASH		20 MPH TO 29
			30 MPH TO 39
			40 MPH TO 49
			50 MPH TO 59
			60 MPH TO 69
			70 AND UP
			SPEED UNKNOWN
			STOP SIGN
			ANIMAL
			PEDESTRIAN
			BICYCLE
			TRAM
			DRIVER AT FAULT
			DRY
			WET
			ICY OR SNOWY
			OTHER

SR 2187 (Jessup Grove Road) 30 mph

SR 2187 (Jessup Grove Road) 45 mph

AADT (Year)
 400 (2006 est.)

AADT (Year)
 3850 (2006)

SR 2124 (Lewiston Road)

AADT (Year)
 6750 (2006)
 45 mph

Frontal Impact
 Target Crashes

N.C. DEPARTMENT of TRANSPORTATION
 DIVISION of HIGHWAYS
 TRANSPORTATION MOBILITY and
 SAFETY DIVISION

TRAFFIC SAFETY UNIT

Date: 6-14-13

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Hatch Mott
 MacDonald

SS# 07-06-201
 Guilford County
 AFTER Period
 1/1/09 - 4/30/13



LEGEND			
	MOVING VEHICLE		ANGLE
	PARKED VEHICLE		TURNING
	PARKING VEHICLE		BACKING
	MOVABLE OBJECT		SIDESWIPE
	HEAD ON		INJURY
	REAR END		FATALITY
	RAN OFF ROAD		9 MPH OR LESS
	DAYLIGHT CRASH		10 MPH TO 19
	NIGHT CRASH		20 MPH TO 29
			30 MPH TO 39
			40 MPH TO 49
			50 MPH TO 59
			60 MPH TO 69
			70 MPH OR MORE
			TO AND UP
			SPEED UNKNOWN
			A ANIMAL
			P PEDESTRIAN
			B BICYCLE
			T TRAIN
			* DRIVER AT FAULT
			D DRY
			W WET
			I ICY OR SNOWY
			O OTHER

SR 2187 (Jessup Grove Road) 30 mph

SR 2124 (Lewiston Road)

AADT (Year)
4100 (2011)

SR 2187 (Jessup Grove Road) 45 mph

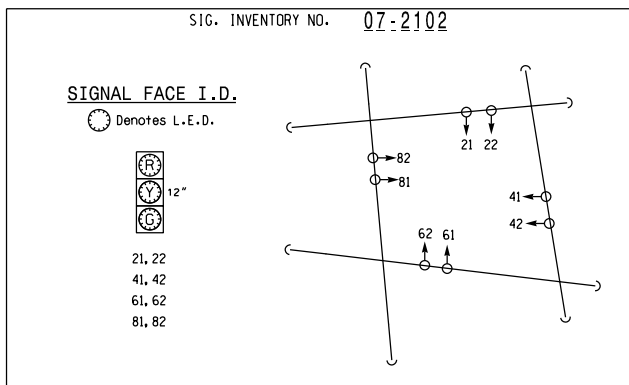
AADT (Year)
5000 (2011)

AADT (Year)
500 (2011 est.)

SR 2124 (Lewiston Road)

AADT (Year)
7700 (2011)

Frontal Impact
Target Crashes



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